pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

SOUTHWEST REGIONAL OFFICE
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0025615**
Facility Type	**Industrial**	APS ID	**588458**
Major / Minor	**Major**	Authorization ID	**639533**

NPDES PERMIT FACT SHEET ADDENDUM

Applicant and Facility Information

Applicant Name	**Energy Harbor Nuclear Corporation**	Facility Name	**Beaver Valley Power Station**
Applicant Address	168 E Market Street	Facility Address	PA Route 168
	Akron, OH 44308-2014		Shippingport, PA 15077
Applicant Contact	Amy Savage	Facility Contact	***same as applicant***
Applicant Phone	(724) 682-7359	Facility Phone	***same as applicant***
Client ID	99862	Site ID	236413
SIC Code	4911	Municipality	Shippingport Borough
SIC Description	Trans. & Utilities - Electric Services	County	Beaver
Date Published in PA Bulletin	March 27, 2021	EPA Waived?	No
Comment Period End Date	April 26, 2021	If No, Reason	Major Facility, Discharge to TMDL waters
Purpose of Application	NPDES permit renewal for discharges of industrial waste, cooling water, and storm water.		

Internal Review and Recommendations

The draft permit for Energy Harbor Nuclear Corporation's Beaver Valley Power Station (BVPS) was published in the *Pennsylvania Bulletin* on March 27, 2021. The 30-day comment period expired on April 26, 2021. DEP received comments from BVPS, the U.S. Environmental Protection Agency, the Pennsylvania Fish and Boat Commission, and the U.S. Fish and Wildlife Service. Responses to comments on the draft NPDES permit are provided in this document.

By letter dated April 5, 2021, BVPS submitted its first set of comments requesting several modifications to the permit. DEP's responses are provided after each comment.

BVPS Request 1. The plant requests a two-year extension to make the modifications necessary to manage and treat low volume waste streams at internal monitoring points (IMP) 601 and 701. These IMPs were created to monitor low volume waste streams, as part of the new draft permit published March 27, 2021.

As you might recall from our previous discussions, IMP 601 is a small sump with an estimated flow of <0.001 MGD. IMP 701 is intended to capture various sources of equipment drainage and leakage that is discharged to the cooling tower blowdown line (Outfall 001). These internal monitoring points will be monitored for low volume waste parameters pH, TSS, and Oil & Grease.

BVPS has identified that sampling and potentially treating wastewater at these new IMPs will be a challenge due to limited sump and storage capacity and limited space inside the plant. Additionally, we may periodically be challenged with meeting pH and TSS limits at these IMPs depending on plant conditions and Ohio River conditions. Per prior discussions with PADEP staff, BVPS is exploring several options including operational and equipment modifications to meet the new requirements. BVPS has identified potential solutions for water management both online and during outages; however, these solutions are not easily or quickly implemented due to the complex process for making changes at a nuclear facility. The time required to develop the engineering design changes, allocate funding, plan the work, and implement these changes will take longer than the available time before the permit renewal is anticipated to be issued.

Approve	Return	Deny	Signatures	Date
X			Ryan C. Decker Ryan C. Decker, P.E. / Environmental Engineer	June 15, 2021
X			Michael E. Fifth Michael E. Fifth, P.E. / Environmental Engineer Manager	June 16, 2021

Internal Review and Recommendations

Therefore, a two-year extended implementation period at IMPs 601 and 701 will provide additional time needed to make the modifications necessary to manage and treat these low volume waste streams. The pH limit at final outfall 001 is not expected to be challenged at any time by the flow contributions of the 601/701 waste streams based on our operating experience and sampling history.

DEP Response to BVPS Request 1: As discussed with staff from the BVPS, the Clean Water Act's deadlines for complying with BPT and BAT limits have passed. U.S. EPA's 2010 NPDES Permit Writers' Manual explains:

> The final statutory deadline for meeting BPT requirements was July 1, 1977, and the final statutory deadline for meeting BCT and BAT requirements was March 31, 1989. When applying applicable effluent guidelines, permit writers should note that they do not have the authority to extend the statutory deadlines in an NPDES permit; thus, all applicable technology-based requirements (i.e., effluent guidelines and case-by-case limitations based on BPJ) must be applied in NPDES permits without the benefit of a compliance schedule.

DEP understands that IMPs 601 and 701 are new monitoring points. However, the TSS, oil and grease, and pH limits at IMPs 601 and 701 are BPT limits imposed based on federal effluent guidelines that have been in effect since 1974. Therefore, per the Clean Water Act and U.S. EPA, DEP cannot include a schedule of compliance in the permit even if it is reasonable to do so with IMPs 601's and 701's wastewaters being newly identified (albeit existing) low volume waste sources. BVPS should consider all options for temporary sampling, collection, piping, pumping, and/or re-routing while permanent operational and equipment modifications are considered. For example, flexible hoses and pumps to re-route the low volume wastes to existing facilities that manage those wastewaters and are already subject to the TSS, oil and grease, and pH limits.

DEP acknowledges that the pH limits at Outfall 001 are not likely to be challenged, but Outfall 001 is not subject to all the applicable BPT limits for low volume waste sources and flow weighted TSS and Oil and Grease limits are impractical at that location, so the existing discharge pathway through Outfall 001 is insufficient for regulatory purposes.

BVPS Request 2: The plant requests a two-year delayed implementation of the mercury limits being established in this permit renewal. During this time, we proposed to continue to sample at all required outlets as a report-only parameter. Based on our very limited sampling history with this parameter, there is some uncertainty as to whether we will be challenged to meet these limits all year with changing seasons and river conditions. We would like some more time to establish a comprehensive sample history so that we can understand what correlation, if any, there may be between our intake water mercury concentrations and our discharge water.

DEP Response to BVPS Request 2: 25 Pa. Code § 92a.51 allows schedules of compliance for existing discharges that are not currently in compliance with water quality standards. Available data indicate that all outfalls subject to new mercury WQBELs will be able to comply with those limits upon permit issuance. However, DEP acknowledges that BVPS is uncertain whether mercury WQBELs will be achieved at all times due to potential variations in the presumed source of mercury (intake water from the Ohio River) that are not captured by BVPS's limited mercury sampling and analyses conducted for the application.

Schedules of compliance require permittees to take specific actions to ensure compliance with WQBELs so that permittees are not being given more time to comply than they need. 25 Pa. Code § 92a.51(a) requires compliance "as soon as practicable". For that reason, it is not enough for BVPS to only collect data for two years. The permit will require BVPS to act meaningfully upon the collected data.

In accordance with DEP's "Standard Operating Procedure (SOP) for Clean Water Program Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers" [SOP No. BCW-PMT-037, Version 1.5, 5-20-2021], the compliance schedule for mercury at Outfalls 001, 003, and 011 will require site-specific data collection, a toxics reduction evaluation, and a final WQBEL compliance report.

BVPS Request 3: The plant requests a two-year delayed implementation of the stormwater iron benchmark limits established in this permit renewal. Seven new stormwater outfalls have been stablished with this permit with which we have very limited sample history. There is some uncertainty as to whether we will be challenged to meet these benchmarks. We would like some more time to establish a comprehensive sample history so that we can understand what challenges we might have with managing stormwater iron. During this time, we will continue to sample and report results from these outfalls, implement best management practices, and pursue any necessary corrective actions associated with elevated stormwater contaminants.

Internal Review and Recommendations

DEP Response to BVPS Request 3: DEP does not consider delayed implementation of the storm water iron benchmark to be appropriate. Under the permit, storm water discharges subject to the iron benchmark values must be sampled 1/6 months. BVPS can develop a comprehensive sampling history by sampling storm water discharges more frequently than the permit requires resulting in storm water characterization much sooner than two years.

Also, exceeding a benchmark value does not qualify as a permit violation. The permit includes requirements to address excursions above the benchmark values. The requirements are limited to the submission and implementation of a corrective action plan after two consecutive exceedances of the benchmark. At the permit's 1/6 months monitoring frequency, the earliest BVPS might have to take an action is one year after the permit takes effect. Additionally, unlike toxic pollutants subject to WQBELs, corrective actions for storm water are much easier to implement, usually only requiring changes to a facility's Best Management Practices. For example, BVPS could install filter inserts in its catch basins to capture sediments that might contribute to increased iron in storm water.

BVPS Request 4: BVPS is also requesting a period of ninety (90) days to comply with the final permit following issuance to allow the site sufficient time to align the current procedures and business practices with the new permit requirements.

DEP Response to BVPS Request 4: DEP will consider delaying the effective date of the final permit when it is issued. Since the permit will be drafted again, BVPS will have additional time to prepare to implement the new permit.

By letter dated April 22, 2021, BVPS provided a second set of comments on the draft permit. The Department's responses to BVPS's comments are provided below after each comment.

BVPS Comment 1: Permit Section A.I.A. p.2, Outfall 101: For clarification, BVPS requests that Unit 2 steam generator drain and fill water be added as another sources to the description for "type of effluent."

DEP Response to BVPS Comment 1: The "Type of Effluent" description for IMP 101 is modified as follows (changes in bold):

Unit #1 chemical waste sump receiving wastewater from lab sink drains, secondary system process analyzer drains, container rinse water, condensate and steam generator drains; Unit #1 water treating chemical storage area floor drains, elementary neutralization and air compressor condensation; **Unit #2 steam generator drain and fill water**

BVPS Comment 2: Permit Section A.I.D. p.5, Outfall 601: For clarification, BVPS requests that "type of effluent" note to include "alternately discharged to Outfall 103."

DEP Response to BVPS Comment 2: The "Receiving Waters" description for IMP 601 is modified as follows (changes in bold):

Ohio River (WWF) through Outfall 001 **or, alternatively, the Ohio River through Outfall 003 via IMP 103 or IMP 403**

BVPS Comment 3: Permit Section A.I.#. p.6, Outfall 701: For clarification, BVPS requests that "type of effluent" note to include "alternately discharged to Outfall 103."

DEP Response to BVPS Comment 3: The "Receiving Waters" description for IMP 701 is modified as follows (changes in bold):

Ohio River (WWF) through Outfall 001 **or, alternatively, the Ohio River through Outfall 003 via IMP 103 or IMP 403**

BVPS Comment 4: Permit Section A.I.F. p.7, Outfall 001: BVPS requests that Outfalls 601 and 701 be added as contributors to "type of effluent."

DEP Response to BVPS Comment 4: The "Type of Effluent" description for Outfall 001 is modified as follows (changes in bold):

Unit #1 and Unit #2 cooling tower blowdown; sources monitored at IMPs 101, 301, ~~and~~ 401**, 601, and 701**; and treated radioactive waste

Internal Review and Recommendations

BVPS Comment 5: Permit Section A.I.F. p.8, Outfall 001: BVPS requests that the Nalco H150M footnote should be (9) and not (8).

DEP Response to BVPS Comment 5: The footnote for Nalco H150M at Outfall 001 is updated per BVPS's comment.

BVPS Comment 6: Permit Section A.I.K. p.13, Outfall 403: For clarification, BVPS requests that Outfall 601 and 701 also be added as another source to the description for "type of effluent." BVPS also requests a note in the "type of effluent" description that this IMP applies only when discharged through MH 1834.

DEP Response to BVPS Comment 6: The "Type of Effluent" description for IMP 403 is modified as follows (changes in bold):

Unit #1 SW Circ Pit receiving wastewater from equipment drains and intermittent discharges of condensate blowdown **discharged through MH 1834; may also include wastewaters from IMP 601 and IMP 701**

BVPS Comment 7: Permit Section A.I.L. p.14, Outfall 003: BVPS requests the Flow that is currently 2/month measured be changed to Estimated Flow. This outfall is currently estimated and BVPS is unable to install a flow meter on this line.

DEP Response to BVPS Comment 7: The required sample type for Flow at Outfall 003 will be changed to 'Estimate'.

BVPS Comment 8: Permit Section A.I.M. p.15, Outfall 004: BVPS requests the Flow that is currently 1/week measured be changed to Calculated Flow. This Outfall is currently calculated based on the weir level.

DEP Response to BVPS Comment 8: The required sample type for Flow at Outfall 004 will be changed to 'Calculation'.

BVPS Comment 9: Permit Section A.I.U. p.23, Outfall 011: BVPS requests Total Mercury Required Sampling Frequency be changed from 2/month to 1/month.

DEP Response to BVPS Comment 9: A reduction in the monitoring frequency would not be consistent with BVPS's request to delay implementation of the new mercury limits to allow time to collect more mercury data. Granting both of BVPS's requests (reduced monitoring and more time) would give BVPS more time to collect data and simultaneously reduce the amount of data collected during that time, thus contradicting the purpose of the delay. For this reason, the sampling frequency will remain unchanged.

Please note that the permit can be amended during its term to adjust sampling frequencies if there is justification to do so. For example, if BVPS collects data that demonstrates that it can comply with mercury limits consistently throughout the year, then DEP may consider a decrease in the sampling frequency at BVPS's request.

BVPS Comment 10: Permit Section A.I.X. p.26, Outfall 013: BVPS requests the Total Copper Sample Type be changed from 24-Hr Composite to Grab.

DEP Response to BVPS Comment 10: The sample type for copper will be changed to 'Grab'.

BVPS Comment 11: BVPS requests the ability to send low volume wastewater to the Unit 2 Circ pit, monitored at IMP 103.

DEP Response to BVPS Comment 11: Per a phone call with BVPS staff on June 10, 2021, this request is addressed by DEP's Responses to BVPS Comments 2 and 3. The Unit 2 Circ Pit is not shown on the facility's flow diagram, but that pit will be used to install a pump to transfer low volume waste sources from Unit #2 to Unit #1's facilities that are equipped to treat low volume waste sources.

BVPS Comment 12: BVPS requests the ability to send steam generator draining water to the Unit 1 Chemical waste sump, monitored at IMP 101.

DEP Response to BVPS Comment 12: Per a phone call with BVPS staff on June 10, 2021, this request is addressed by DEP's Response to BVPS Comment 1.

Internal Review and Recommendations

By email dated April 14, 2021, U.S. Environmental Protection Agency provided comments on the draft permit relating to Cooling Water Intake Structure requirements. DEP requested clarification of EPA's comments on April 15, 2021, which EPA provided by email dated April 21, 2021. DEP responded to EPA's email on April 21, 2021 and participated in a call with EPA on April 22, 2021 to address EPA's concerns. As a result, EPA indicated on April 28, 2021 that it had no additional comments. EPA's and DEP's correspondence is reproduced below.

> According to the Memorandum of Agreement (MOA) between the U.S. Environmental Protection Agency Region III (EPA) and the Pennsylvania Department of Environmental Protection (PADEP), the EPA has reviewed the draft National Pollutant Discharge Elimination System (NPDES) permit for:
>
> Draft Permit: Energy Harbor Nuclear Corporation
> Also known as: Beaver Valley Power Station
> Previously known as: FirstEnergy Nuclear Operating Company
> NPDES Number: PA0025615
> EPA-received: March 16, 2021
> 30-day Response: April 15, 2021
>
> EPA has chosen to perform a limited review of the draft permit based on the 2014 Cooling Water Intake Structure Rule (CWIR) requirements. As a result of our limited review, we offer the following comments.
>
> 1. On March 23, 2021, PADEP Central Office provided EPA with an updated boiler language template for CWIR. Please compare this updated boiler plate template with the related requirements proposed in the draft permit to capture and impose all the applicable requirements to conform to CWIR.
>
> 2. PADEP is proposing to make a final determination on the best technology available (BTA) for minimizing adverse environmental impact. The data showed that, once this permit has been reissued, the facility may be in noncompliance with CWIR due to operation and maintenance processes planned/established until the facility has optimized such processes. The data must be associated with technologies for minimizing impingement mortality or entrainment that are currently viable for use by industries with cooling water intake structures that are subject to CWIR. The data must represent a quantitative measure that is related to the impingement mortality or entrainment of some life form of aquatic organisms within cooling water intake structures under the given technology. Please further explain the applicable requirements to this site-specific process and how this draft permit will address any noncompliance issues in the future.
>
> Please address our comments and recommendations, and provide us with any changes to the draft permit, fact sheet, and/or permit components. If for any reason, the draft permit is modified from the version that was submitted to EPA on March 16, 2021, as provided in the MOA, PADEP is to submit a copy of the new draft permit for EPA review before issuance of a final permit. Should you have any questions, please contact Joel Blanco-Gonzalez by email at blanco-gonzalez.joel@epa.gov and/or by phone at (215) 814-2768.
>
> Should you have any questions or concerns regarding this matter, please contact me.
>
> Respectfully,
>
> Jen Fulton
>
> Jennifer Fulton, Acting Chief
> Clean Water Branch
> Water Division (3WD40)
> U.S. EPA Region 3
> 304-234-0248

DEP requested clarification of EPA's comments by email dated April 15, 2021:

> Can you clarify the meaning of the second comment? What data are you referencing when you say that the facility may be in non-compliance? Beaver Valley uses a closed-cycle recirculating system and we do not expect non-compliance with § 316(b) with the use of that technology.

Internal Review and Recommendations

EPA provided the following clarification by email dated April 21, 2021:

> As promised, below, please find a clarification to our comments and recommendations on a draft permit for the Energy Harbor Nuclear Corporation (PA0025615).
>
> The line below is set forth in the fact sheet…
>
> "…However, those velocities will not be accounted for as part of BTA for entrainment because FENOC also reported that design and actual through-screen velocities will exceed 0.5 feet per second when pool elevations are low (0.59 feet per second and 0.53 feet per second, respectively)…"
>
> Clarification…
>
> The 2014 Cooling Water Intake Structure Rule requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available (BTA) for minimizing adverse environmental impact. PADEP is proposing to finalizing, informing, and documenting its BTA determination as part of this permit reissuance. The fact sheet explains that there have been and there will be velocities exceeding 0.5 feet per second. Once the permit is reissued, velocities higher than 0.5 may put the facility in noncompliance with the terms of the permit.
>
> - Has the facility planned to change its operation and maintenance processes to control any velocity increment?
> - Has PADEP communicated to the facility that, once the permit is reissued, their may be in noncompliance?
> - Please address the questions above. I would like to have a phone to continue this conversation. Thank you.
>
> Should you have any questions or concerns regarding this matter, please contact me.
>
> Respectfully,
>
> Joel
>
> Joel Blanco-González
> U.S. EPA Region III (Mid-Atlantic)
> (215) 814-2768

DEP responded on April 21, 2021 as follows:

> Thanks for the clarification. We are not identifying 0.5 feet per second through-screen actual or design velocity as BTA for the facility. Therefore, the facility will not be in noncompliance if through-screen velocities exceed 0.5 feet per second. Operation of a closed-cycle recirculating system (and only operation of a closed-cycle recirculating system) is identified as BTA for impingement and entrainment in Part C, Condition V (page 58) of the draft permit.
>
> The Fact Sheet was explaining that having actual or design through-screen velocities of 0.5 fps could not be identified as BTA because Energy Harbor's intake velocities may exceed 0.5 fps in some circumstances. It is not necessary for the facility to have both a closed-cycle recirculating system and through-screen velocities of 0.5 fps to have BTA.

EPA concluded on April 28, 2021 with the following:

> Thank you for our April 22, 2021 phone call regarding this matter, Ryan. Based on our email exchanges and phone call, EPA will not be providing any additional comment to the issuance of this permit. If for any reason, the draft permit is modified from the version that was submitted to EPA on March 16, 2021, as provided in the MOA, PADEP is to submit a copy of the new draft permit for EPA review before issuance of a final permit.
>
> Should you have any questions or concerns regarding this matter, please contact me.
>
> Respectfully,
>
> Joel

Internal Review and Recommendations

Joel Blanco-González
U.S. EPA Region III (Mid-Atlantic)
(215) 814-2768

DEP Response to EPA Comment 1: BVPS is unaffected by the revised permit language EPA references in Comment 1 because BVPS provided the necessary information to make a BTA determination with this permit renewal.

DEP Response to EPA Comment 2: With respect to EPA's concerns about noncompliance with the 2014 Cooling Water Intake Structure Rule, refer to DEP's April 21, 2021 response to EPA above.

By letter dated April 14, 2021, the Pennsylvania Fish and Boat Commission provided the following comments on the draft NPDES permit.

The Pennsylvania Fish and Boat Commission (PFBC) has reviewed information pertaining to the draft NPDES permit renewal for the Beavery Valley Power Station, located in Shippingport Borough, Beaver County, Pennsylvania. The comments below are provided regarding aquatic resource concerns resulting from the activities within the scope of this project.

1. The Ohio River historically supported a healthy and diverse freshwater community that has been impacted by a long history of human degradation. Recent improvements in water quality have led to recoveries in the basin's aquatic resources and range expansions of native species. The section of the Ohio River around Phillis Island and the Beaver Valley Power Station (BVPS) supports populations of the PA state endangered Ghost shiner (*Notropis buchanani*) along with several PA freshwater mussel species of greatest conservation need (SGCN). PFBC would like to stress the importance of providing adequate protection from human-induced stressors, including contaminants and degradation of water quality, that could threaten the diverse community that inhabits this section of river.

2. Fish are susceptible to impingement and entrainment (I&E) mortality at any cooling-water intake structure (CWIS). We acknowledge BVPS's adherence to Best Technology Available standards to help reduce I&E impacts at the intake, including implementation of a closed cycle recirculating system and water velocities lower than a recommended 0.5 foot per second threshold (under normal flow conditions). Even with these measures, fish eggs and larval fish can succumb to I&E effects at these and similar intake structures. In addition to the above-mentioned velocity thresholds, PFBC also recommends intake screen mesh size no greater than 3/16 inches for floating intake structures and no greater than 1/10 inches for submerged intake structures. Previous PNDI reviews have indicated that the PA endangered Ghost Shiner (*N. buchanani*) is known from the project area. Furthermore, there are many sport fish species present including but not limited to Smallmouth Bass (*Micropterus dolomieu*), Largemouth Bass (*M. salmoides*), Spotted Bass (*M. punctulatus*), Rock Bass (*Ambloplites rupestris*), Walleye (*Sander vitreus*), Sauger (*S. canadensis*), Channel Catfish (*Ictalurus punctatus*), and Flathead Catfish (*Pylodictis olivaris*). In addition to supporting recreational angling opportunities, these and other fish species serve as hosts for developing freshwater mussels that use fish for dispersal into historically occupied habitats. Based on potential direct and indirect effects to state Endangered fish species, sport fish species, and mussel host fish species, PFBC supports consideration of monitoring I&E effects at the CWIS.

3. Freshwater mussels are largely sessile organisms and are therefore some of the most highly susceptible species to changes in water quality. PFBC is particularly concerned about the use of molluscicides by BVPS. These chemicals, while used primarily to treat for invasive zebra mussels and Asian clams, are not species-specific and can cause direct mortality to native freshwater mussels. Bentonite is a fine clay used to deactivate these biocides. While bentonite is unlikely to be toxic, freshwater mussels and other benthic organisms are vulnerable to high concentrations of sediments and particulate matter (such as bentonite clay) which can clog their gills and, in mussels, lead to suffocation or brood evacuation. We suggest that BVPS limit their use of molluscicides and bentonite clay when at all possible. Sediment transport models documenting the location and extent of downstream bentonite transport would be useful for determining to what degree the use of this deactivating compound could be deposited downstream and harm existing benthic communities.

We appreciate your consideration of these comments and commend the efforts that DEP has taken to address the conservation concerns pertaining to the aquatic resources in the Ohio River. If you have questions or would like to discuss these comments further please do not hesitate to contact me via email (hgalbraith@pa.gov) or phone (814-330-5111).

Internal Review and Recommendations

DEP Response to PFBC Comment 1: BVPS has been operating similarly to its current state for over 30 years. To the extent that the section of the Ohio River around Phillis Island and the Beaver Valley Power Station (BVPS) currently supports populations of the PA state endangered Ghost shiner (*Notropis buchanani*) along with several PA freshwater mussel species of greatest conservation need, the river's support of those populations implicitly accounts for the presence of BVPS and its cooling water intake structure and point source discharges. For that reason, the continued operation of BVPS in its current state is not expected to degrade existing fish and mussel populations. Furthermore, except for zinc limits at Outfall 012, permit requirements are generally equivalent to or more stringent than the requirements in the existing permit. Consider, for example, that this permit implements Clean Water Act § 316(b)'s impingement and entrainment requirements for BVPS's cooling water intake structure for the first time.

DEP Response to PFBC Comment 2: As PFBC states, BVPS already adheres to BTA standards. BVPS's operation of a closed-cycle recirculating system is identified as BTA. BVPS estimates that operation of that system by which intake flows from the river are only used for makeup water represents a 94.4% reduction in water withdrawals at BVPS's 82.2 MGD actual intake flow rate (BVPS's circulating cooling water flow is about 1,461 MGD).

Please note that, as explained in DEP Response to EPA Comment 2, a 0.5 fps actual or design through-screen velocity is not part of BTA because when the Ohio River is at minimum water levels, actual and design through-screen velocities may exceed 0.5 fps. BVPS estimates actual and design through-screen velocities at minimum water levels to be 0.53 fps and 0.59 fps, respectively.

DEP Response to PFBC Comment 3: A maximum daily effluent limit for bentonite is established in Part C of the permit (Condition IV). The limit is 35 mg/L. DEP's understanding is that macrofouling control by BVPS is undertaken quarterly. Quarterly discharges from BVPS containing up to 35 mg/L of bentonite would not represent a consistent source of suspended/settleable solids in the river, so the potential harm to benthic communities exhibited by BVPS's intermittent use and discharge of bentonite is low (and nevertheless is better than potential harms represented by discharges of un-detoxified macrofouling biocide, the use of which is necessary to safely and efficiently operate the power plant).

PFBC does not identify what constitutes "high concentrations of sediments", so it is unclear at what level potential harms to benthic communities might occur and whether that level is already exceeded in the river before any accounting for BVPS's discharges. However, the concentrations of TSS in the Ohio River based on concentrations reported at Water Quality Network Station 902 – Ohio River at Sewickley (upstream of BVPS) exceed BVPS's 35 mg/L bentonite discharge limit about 14% of the time, so the concentrations of suspended solids in the Ohio River and the deposition of sediments that might cause harm to benthic communities resulting from in-stream TSS concentrations of 35 mg/L or more already exist in the river without accounting for BVPS's influence.

BVPS's contribution to increases in the TSS concentration of the Ohio River represented by intermittent discharges of bentonite are small. At Outfall 001's normal discharge rate of 36 MGD and at the Ohio River's $Q_{7\text{-}10}$ flow rate of 5,880 cfs and an average TSS concentration of 23 mg/L (based on WQN 902 data), BVPS would theoretically contribute to a TSS concentration increase of 0.11 mg/L (see calculation below). An intermittent increase in the Ohio River's TSS concentration by 0.11 mg/L does not elevate TSS concentrations downstream of BVPS significantly and the TSS concentrations of the river normally vary by much more than 0.11 mg/L. Consequently, it is unlikely that BVPS's incremental increase in the Ohio River's TSS concentrations resulting from its intermittent discharges of bentonite would put sediment concentrations in the river over an unspecified high concentration threshold.

$$((Q_{Discharge} \times C_{TSS\ Discharge}) + (Q_{Ohio\ River} \times C_{TSS\text{-}Ohio\ Upstream})) / (Q_{Discharge} + Q_{Ohio\ Upstream}) = C_{Ohio\text{-}Downstream}$$

$$((36\ MGD \times 35\ mg/L) + (5{,}880\ cfs \times 23\ mg/L)) / (36\ MGD + 5880\ cfs) = C_{Ohio\text{-}Downstream}$$

$$((36\ MGD \times 35\ mg/L) + (5{,}880\ cfs \times 23\ mg/L)) / (36\ MGD + 5880\ cfs) = C_{Ohio\text{-}Downstream}$$

$$((55.7\ cfs \times 35\ mg/L) + (5{,}880\ cfs \times 23\ mg/L)) / (55.7\ cfs + 5880\ cfs) = C_{Ohio\text{-}Downstream}$$

$$C_{Ohio\text{-}Downstream} = (1949.5 + 135{,}240) / 5935.7\ cfs = 23.11\ mg/L$$

By letter dated April 21, 2021, the U.S. Fish and Wildlife Service provided the following comments on the draft NPDES permit:

Internal Review and Recommendations

The U.S. Fish and Wildlife Service (Service) offers the following comments regarding the Energy Harbor Nuclear Corporation's Beaver Valley Power Station (BVPS) NPDES Permit (Permit) Number PA0025615. We are submitting these comments in accordance with the Fish and Wildlife Coordination Act (16 U.S.C. 661-667e) and the National Wildlife Refuge Administration Act Sec. 668dd, 50 CFR27.51(a) Disturbing injuring and damaging plants and animals, and 50 CFR 27.94(a) Disposal of waste.

The primary outfall (001) for BVPS is immediately upstream of Phillis Island, an island which is part of the Ohio River Islands National Wildlife Refuge (NWR). The Service has trusteeship for all biotic and abiotic resources included within NWR boundaries. Freshwater mussels, a primary resource for this NWR, are sedentary filter-feeders, and as such, they are vulnerable to substrate disturbance, silt deposition, scouring, water quality degradation, changes in channel morphology, and alterations of river hydrology.

The aquatic habitat associated with Phillis Island contains some of the best freshwater mussel habitat in the Pennsylvania pools of the Ohio River. Surveys conducted by Service staff beginning in the 1990's continue to document a diverse mussel community around the island. Due to the habitat quality and known mussel population, the Service relocated 2,866 mussels from 12 species to locations around Phillis Island between 2004 and 2007. The relocations were conducted as part of mitigation efforts for bridge replacements on the Allegheny River. Surviving mussels from the reintroduction efforts were documented onsite in 2009 and 2019, indicating that the area continues to serve as a refugium for these displaced animals.

The Service has reviewed the provisions in the Permit and Fact Sheet pertaining to the chemical control of invasive molluscs within BVPS. The permittee is authorized to add 7,000 pounds per day of macrofouling biocide and 21,000 pounds per day of bentonite-based detoxicant ("detoxicant") for a period not to exceed 24 hours on an as-needed basis. This 1:3 ratio was relevant to the previously used biocide (Clam-Trol CT-1). However, the product label for the proposed biocide (Nalco H150M) is 1:5 http://legacy.picol.cahnrs.wsu.edu/~picol/pdf/OR/58458.pdf). At 1:3 maximum discharges listed in permit, up to 2,800 pounds of the Nalco H150M could enter the river without being deactivated. Native mussels are exceptionally sensitive to the ammonia and chloride constituents of this biocide. Mussels in the vicinity of Outfall 001 and around Phillis Island could be exposed to lethal concentrations.

The permit calls for immediate termination of the biocide use if the product exhibits toxicity or impairment to the receiving stream's aquatic life use. No monitoring provisions are included in the permit to verify that the native mussel community is not being impaired by use of this product. Dead or sickened mussels cannot be observed on the river surface. The Service requests that periodic mussel surveys be conducted to demonstrate that the standard operating protocol for the biocide is protective of native mussels. We have established a survey protocol that includes Phase I and Phase II mussel surveys to be conducted by a qualified biologist. Please see our protocol at: jnbs-25-03-15 701..711 (fws.gov) and qualified mussel surveyors at: https:www.fws.gov/northeast/pafo/pdf/Mussel_qualified_00082020.pdf

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DEP Response to USFWS Comments: DEP proposes to revise the Macrofouling Control Chemicals condition (Part C Condition IV) as shown below. According to USFWS comment letter, the USFWS conducts periodic mussel surveys near Phillis Island, so it is not necessary for BVPS to conduct surveys. As explained in DEP's Response to PFBC Comment 1, the continued existence of a diverse mussel population in the vicinity of Phillis Island implicitly accounts for the presence of BVPS and its cooling water intake structure and point source discharges (including BVPS's historical use of macrofouling chemicals, which would have been fully detoxified prior to discharge).

The permit has NALCO H150M effluent limits that require BVPS's macrofouling biocide to be undetectable in the effluent and for the biocide to be fully deactivated/detoxified prior to discharge. The permit's terms and conditions (as modified below) preclude the occurrence of adverse impacts to downstream mussel populations, provided that BVPS complies with the permit.

IV. MACROFOULING CONTROL CHEMICALS

The permittee is authorized to use NALCO H150M macrofouling biocide ("biocide") to control the growth of clams and mussels in the facility's cooling water systems. Effluent limitations for NALCO H150M are imposed at outfalls that may

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be affected by the biocide including Outfalls 001, 003, 007, and 010. If another outfall is likely to be affected by the biocide, then the permittee shall 1) notify DEP in writing prior to the dosing event for which the other outfall(s) may be affected and 2) sample effluent from those other outfalls for NALCO H150M when those outfalls discharge from facilities that have been treated with biocide. The effluent concentration of NALCO H150M shall not be detectable in the effluent.

The biocide shall be used in accordance NALCO's directions for use:

MACROFOULING CONTROL IN RECIRCULATING AUXILIARY COOLING WATER AND WASTEWATER SYSTEMS

- *INITIAL DOSE: For the control of macro fouling growth such as clams, barnacles and mussels, add 0.3-2.6 fluid ounces of H150M per 1,000 gallons of system water (2-20 ppm, 1-10 ppm a.i.). Repeat as necessary to achieve control.*

- *SUBSEQUENT DOSE: When control is evident, add 0.3-1.3 fluid ounces of H150M per 1,000 gallons of system water (2-10 ppm, 1-5 ppm a.i.) as needed to maintain control.*

ONCE-THROUGH COOLING WATER SYSTEMS INTERMITTENT FEED

- *INITIAL DOSE: When the system is noticeably fouled, add H150M at a dosage of 0.3-2.6 fluid ounces per 1,000 gallons of water (2-20 ppm, 1-10 ppm a.i.) based on system flow rates. The minimum treatment period should be 6 to 24 hours. Repeat as necessary to achieve control.*

- *SUBSEQUENT DOSE: When control is evident, add H150M at a dosage of 0.15-1.3 fluid ounces per 1,000 gallons of water (1-10 ppm, 0.5-5 ppm a.i.) based on system flow rates on an as needed basis to maintain control. Frequency of feed should be tied to an in-plant monitoring program for macro fouling growth.*

ONCE-THROUGH COOLING WATER SYSTEMS CONTINUOUS FEED

- *INITIAL DOSE: When the system is noticeably fouled, add H150M at a dosage of 0.15-1.3 fluid ounces per 1,000 gallons of water (1-10 ppm, 0.5-5 ppm a.i.) based on system flow rates. Continue to feed until needed control is achieved.*

- *SUBSEQUENT DOSE: Maintenance control can be effective through continuous feed of H150M at a dosage of 0.05-0.5 fluid ounces per 1,000 gallons of water (0.4-4 ppm, 0.2-2 ppm a.i.) based on system flow rates*

Efforts are to be made to minimize the use of biocide. Simultaneous multi-unit dosing of biocide is prohibited. If the biocide exhibits toxic effects in the receiving stream or otherwise impairs the receiving stream's aquatic life use, biocide use is to be terminated immediately.

DEACTIVATION: The permittee shall ensure that all biocide is deactivated/detoxified prior to discharge to an NPDES outfall. Biocide may be used to treat small subsystems of the plant without deactivation provided that the biocide is not detectable at the final point of discharge. To Deactivate: Use bentonite clay ("detoxicant") at a minimum ratio of 5 ppm clay to 1 ppm product. The detoxicant concentration in the effluent discharged from any outfall shall not exceed 35 mg/L (maximum daily). The amount of detoxicant in a discharge is to be estimated using the feed rate and discharge flow rate if direct measurement of the detoxicant concentration at the point of discharge is not feasible.

The permittee shall submit advanced written notice to DEP at least 14 days before any large system dosings.

The amount of biocide and detoxicant used, the dates and times of biocide and detoxicant dosing, and the results of each dosing event shall be recorded and summarized in a report to the Department at the end of each calendar quarter.

No other comments were received on the draft NPDES permit. Due to the changes made to the draft permit in response to comments, a revised draft permit will be published for a second 30-day comment period.